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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/935,734	08/24/2001	Kanefumi Nakahara	213345US2CONT	9887

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EXAMINER

KIM, PETER B

ART UNIT	PAPER NUMBER
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2851

DATE MAILED: 01/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/935,734

Applicant(s)

NAKAHARA ET AL.

Examiner

Peter B. Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-120 is/are pending in the application.
- 4a) Of the above claim(s) 106-110 and 116-120 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 48-76 and 100-105 is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-24, 26-38, 40-45, 77, 80-82, 84-90, 92-96, 99 and 111-113 is/are rejected.
- 7) ☒ Claim(s) 7, 25, 39, 46, 47, 78, 79, 83, 91, 97, 98, 114 and 115 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) ☒
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6 ✓
- 4) ☒ Interview Summary (PTO-413) Paper No(s) 9.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

This application contains claims 106-110 and 116-120 drawn to an invention nonelected with traverse in Paper No. 8. A complete reply to the final rejection must include cancelation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Objections

Claims 82, are 90 objected to because of the following informalities: "said position" and "said delivery position" lack antecedent basis. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1, 4-6, 8, 14-17, 19-21, 24, and 26-28 are rejected under 35 U.S.C. 102(a) as being anticipated by applicant's admitted prior art.

Applicant's admitted prior art in Fig. 29-32 disclose an exposure apparatus used in a lithography process, a lithography system and a device manufacturing method comprising an exposure main body (306), a laser unit (302) or ArF laser (see page 2) arranged in an area of the floor surface, the width of the area being defined by maintenance areas, on both sides of the exposure main body (p. 5, lines 24-26). Fig. 31 also discloses a housing of the laser unit arranged adjacent to the exposure main body, connected directly to the main body through a

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guide optical system (304) and a substrate-processing unit (308) which is a coater-developer connected to a side of the main body reverse to the laser unit.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 3 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art.

Fig. 29-32 of applicant's admitted prior art disclose the claimed invention as discussed above. Although the Figures do not explicitly indicate overlapping of the maintenance areas, it would have been obvious to one of ordinary skill in the art at the time of the invention to rearrange the placement of the laser unit so that the maintenance area will overlap in order to conserve the floor space.

Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art in view of Fujima (J 09266146).

Fig. 29-32 of applicant's admitted prior art disclose the claimed invention as discussed above. However, the inline-interface portion between the substrate-processing unit and the main body is not disclosed. Fujima discloses an inline-interface portion (14) between the main body and the substrate processing (15). Although Fujima does not explicitly disclose that the interface portion is detachable because the interface portion and the slider (7) are separate structure, the interface portion is likely detachable. Therefore, it would have been obvious to one of ordinary

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skill in the art at the time of invention to provide the interface portion of Fujima to the invention of the admitted prior art because the interface portion facilitates delivery of the wafer from the main body to the processing unit. Although the Figures of the admitted prior art do not explicitly indicate overlapping of the maintenance areas, it would have been obvious to one of ordinary skill in the art at the time of the invention to rearrange the placement of the laser unit so that the maintenance area will overlap in order to conserve the floor space.

Claims 12, 29, and 33-36 is rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art in view of Kimura et al. (Kimura) (6,439,822).

Fig. 29-32 of applicant's admitted prior art disclose the claimed invention as discussed above. However, a delivery port arranged from which a mask container is transported by a ceiling-transport system and the delivery port at a height of 900mm from a floor surface are not disclosed. Kimura discloses a delivery port (4) arranged near the substrate processing unit (100) to and from which a stack of substrate containers is transported by a ceiling-transport system (51) that moves along a rail extending on a ceiling (col. 5, line 53 – col. 6, line 8). Further, the location of the delivery port is a design choice, which can be easily accommodated by the receiving mechanical arm. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to provide the ceiling-transport system and the delivery port to the invention in admitted prior art because the ceiling-transport would facilitate delivery of the mask as well as the substrate.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art in view of Kimura et al. as applied to claim 12 above, and further in view of Bonora et al. (Bonora) (6,364,595).

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The further difference between the modified admitted prior art and the claimed invention is the sealed-type mask container. Bonora discloses in col. 4, line 55-67, a sealed type mask container. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify the admitted prior art because sealed-type mask container protects the mask from the environment.

Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art in view of Nakamura (J 10321518).

Fig. 29-32 of applicant's admitted prior art disclose the claimed invention as discussed above. However, the laser unit arranged on the floor surface so that a longitudinal direction of the laser unit coincides with a longitudinal direction of the exposure apparatus main body. Nakamura discloses in Fig. 1 and 2, the arrangement of the laser unit and the main body as indicated above. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to arrange the laser unit and the exposure main body as claimed so that the maintenance area will be overlapped.

Claims 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art in view of Kimura et al. as applied to claim 29 above, and further in view of Fujima.

The further difference between the claimed invention and the modified admitted prior art is an inline-interface portion. Fujima discloses an inline-interface portion (14) between the main body and the substrate processing (15). Although Fujima does not explicitly disclose that the interface portion is detachable because the interface portion and the slider (7) are separate structure, the interface portion is likely detachable. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to provide the interface portion of Fujima to

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the invention of the admitted prior art because the interface portion facilitates delivery of the wafer from the main body to the processing unit. Although the Figures of the admitted prior art do not explicitly indicate overlapping of the maintenance areas, it would have been obvious to one of ordinary skill in the art at the time of the invention to rearrange the placement of the laser unit so that the maintenance area will overlap in order to conserve the floor space.

Claims 37, 38, 41, 45, 77, 80-82, 84-86, 89, 90, 92-94, 96, 99 and 111-113 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arakawa (6,356,338) in view of Kimura et al. (Kimura).

Arakawa discloses a lithography system in a clean room (Fig. 1) comprising an exposure apparatus (Fig. 1), a mask-container storeroom (20) having a carrying-in port, and a transport mechanism (21) to carry the mask to the exposure apparatus. However, Arakawa does not disclose an orientation-change unit, a ceiling transport system. Kimura discloses an orientation-change unit arranged in the path of the transport mechanism (121) which changes the orientation by rotating the transport mechanism. The transport mechanism is a turntable like structure that supports the wafer at a point, line and plane (Fig. 9). Kimura also discloses a delivery port (4) arranged near the substrate processing unit (100) to and from which a stack of substrate containers is transported by a ceiling-transport system (51) that moves along a rail extending on a ceiling (col. 5, line 53 – col. 6, line 8). Kimura also discloses orientation-change unit that changes orientations of mask containers that are placed in the delivery port (Fig. 4). Although Kimura discloses transporting a substrate, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the transport mechanism of Kimura to the invention

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of Arakawa because both mask and substrate need to be transported and properly oriented before exposure.

Claims 40 and 95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arakawa in view of Kimura et al. as applied to claims 37 and 90 above, and further in view of Suwa (J 03038021).

The further difference between the modified Arakawa and the claimed invention is the detection mechanism for detecting the orientation and based on the results the mask is arranged. Suwa discloses in the abstract pressing rollers which move the mask in different direction to properly orient the mask. Although Suwa does not explicitly disclose a detection mechanism, Suwa must include a detector because in order for Suwa to correctly position the mask, some means of detecting the position or orientation of the mask is necessary. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Arakawa with the detecting mechanism of Suwa in order to correctly position the mask.

Claims 42-44 are are rejected under 35 U.S.C. 103(a) as being unpatentable over Arakawa in view of Kimura et al. as applied to claim 37 above, and further in view of Murata et al. (Murata) (J 09315521).

Arakawa discloses a lithography system in a clean room (Fig. 1) comprising an exposure apparatus (Fig. 1), a mask-container storeroom (20) having a carrying-in port, and a transport mechanism (21) to carry the mask to the exposure apparatus. However, Arakawa does not disclose an orientation-change unit. Kimura discloses an orientation-change unit arranged in the path of the transport mechanism (121) which changes the orientation by rotating the transport mechanism. The transport mechanism is a turntable like structure that supports the wafer at a

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point, line and plane (Fig. 9). Kimura also discloses a delivery port (4) arranged near the substrate processing unit (100) to and from which a stack of substrate containers is transported by a ceiling-transport system (51) that moves along a rail extending on a ceiling (col. 5, line 53 – col. 6, line 8). Kimura also discloses orientation-change unit that changes orientations of mask containers that are placed in the delivery port (Fig. 4). The further difference between the modified Arakawa and the claimed invention is the delivery port located on the ceiling of the mask-container storeroom. Murata discloses in the abstract, a mask-container storeroom with the delivery port on the ceiling. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Arakawa to include a delivery port in the ceiling of the storeroom to better accommodate the ceiling transport.

Claims 87 and 88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arakawa in view of Kimura et al. as applied to claim 77 above, and further in view of Bonora et al. (Bonora).

The further difference between the modified admitted prior art and the claimed invention is the sealed-type mask container and bottom-open-type. Bonora discloses in col. 4, line 55-67, a sealed type mask container and a bottom-open-type (Fig. 5 and 6). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify the admitted prior art because sealed-type mask container protects the mask from the environment.

Allowable Subject Matter

Claims 48-76 and 100-105 are allowed.

None of the prior art of record teaches or discloses a lithography system in a clean room comprising an exposure apparatus, a substrate-processing unit, a first ceiling-transport system

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wherein an optical axis of the projection optical system and the substrate-processing unit, a delivery port is arranged into and from which the mask is loaded and unloaded by the first ceiling-transport system.

None of the prior art of record teaches or discloses a lithography system in a clean room comprising a plurality of exposure apparatuses, a ceiling transport system and an orientation-setting mechanism that is provided on the ceiling transport system which sets the orientation of the mask to be suitable for the exposure before carrying it into the exposure apparatuses.

Claims 7, 25, 39, 46, 47, 78, 79, 83, 91, 97, 98, 114, and 115 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

None of the prior art of record teaches or discloses an exposure apparatus comprising an exposure apparatus main body, and a laser unit and a guide optical system arranged below a floor surface.

None of the prior art of record teaches or discloses an exposure apparatus comprising a mask-container storeroom, a transport mechanism and an orientation-change unit on the ceiling of the mask-container storeroom or a mask container that has an opening and the orientation-change unit changing the orientation of the mask according to the direction of the opening.

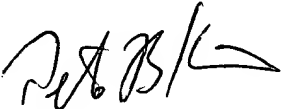
None of the prior art of record teaches or discloses a lithography system in a clean room comprising a first and a second ceiling-transport, an orientation-change unit changing the orientation of the mask during transport by the first ceiling-transport, a mask container that has an opening and the orientation-change unit changing the orientation of the mask according to the direction of the opening.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Kim whose telephone number is (703) 305-0105. The examiner can normally be reached on Monday-Thursday from 6:30 AM to 4:00 PM. The examiner can also be reached on alternate Fridays during the same hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams, can be reached on (703) 308-2847. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.



Peter B. Kim
Patent Examiner
January 25, 2003